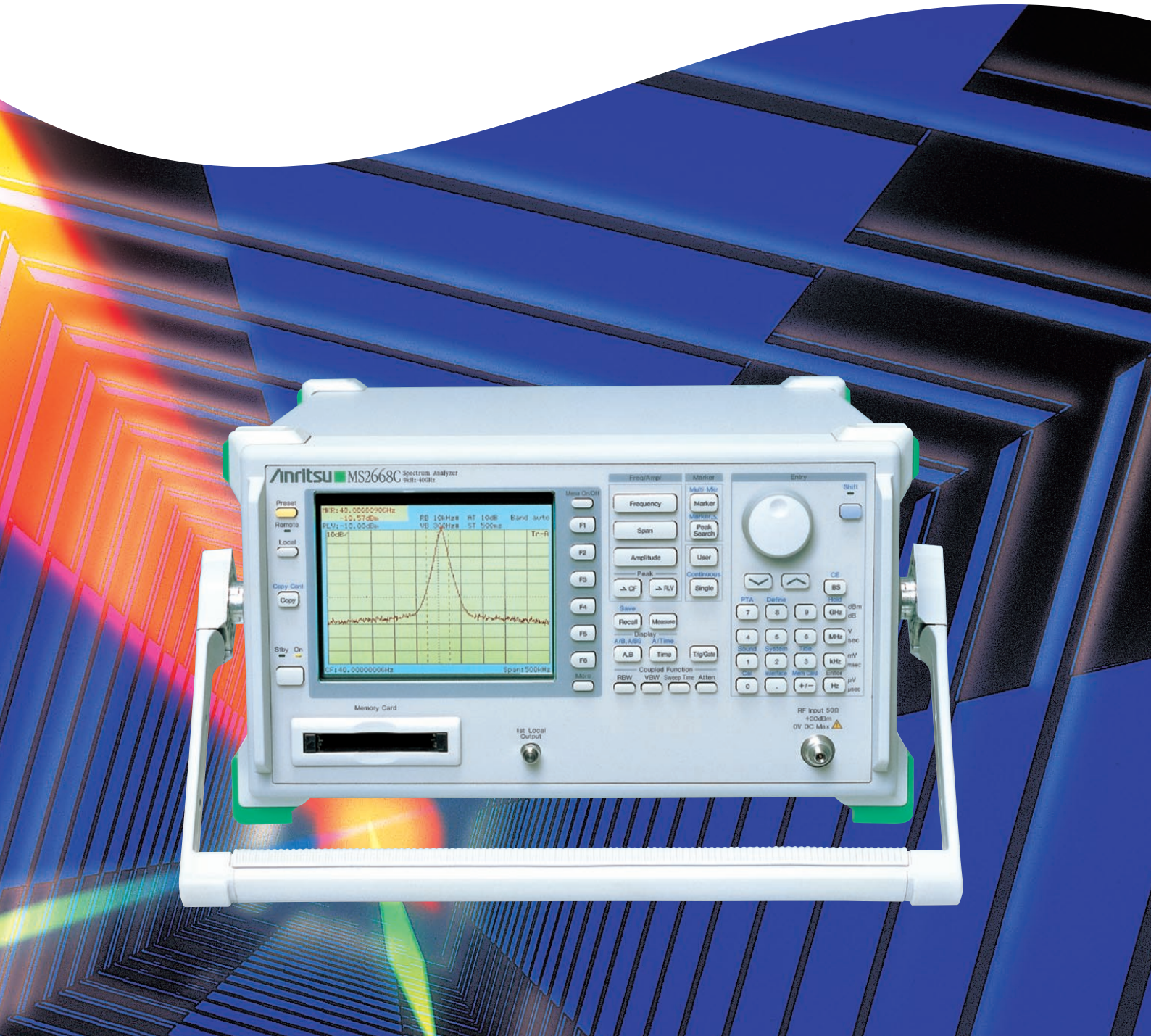
Product Brochure

Anritsu

MS2668C

Spectrum Analyzer

9 kHz to 40 GHz (18 GHz to 110 GHz)



The MS2668C is a compact, lightweight and low-price spectrum analyzer covering the frequency range from 9 kHz to 40 GHz.
It has superior basic performance, such as high C/N ratio, low distortion, and high frequency/level accuracies, and is easy to operate.
The large selection of options means a wide range of applications can be handled at reasonable cost.

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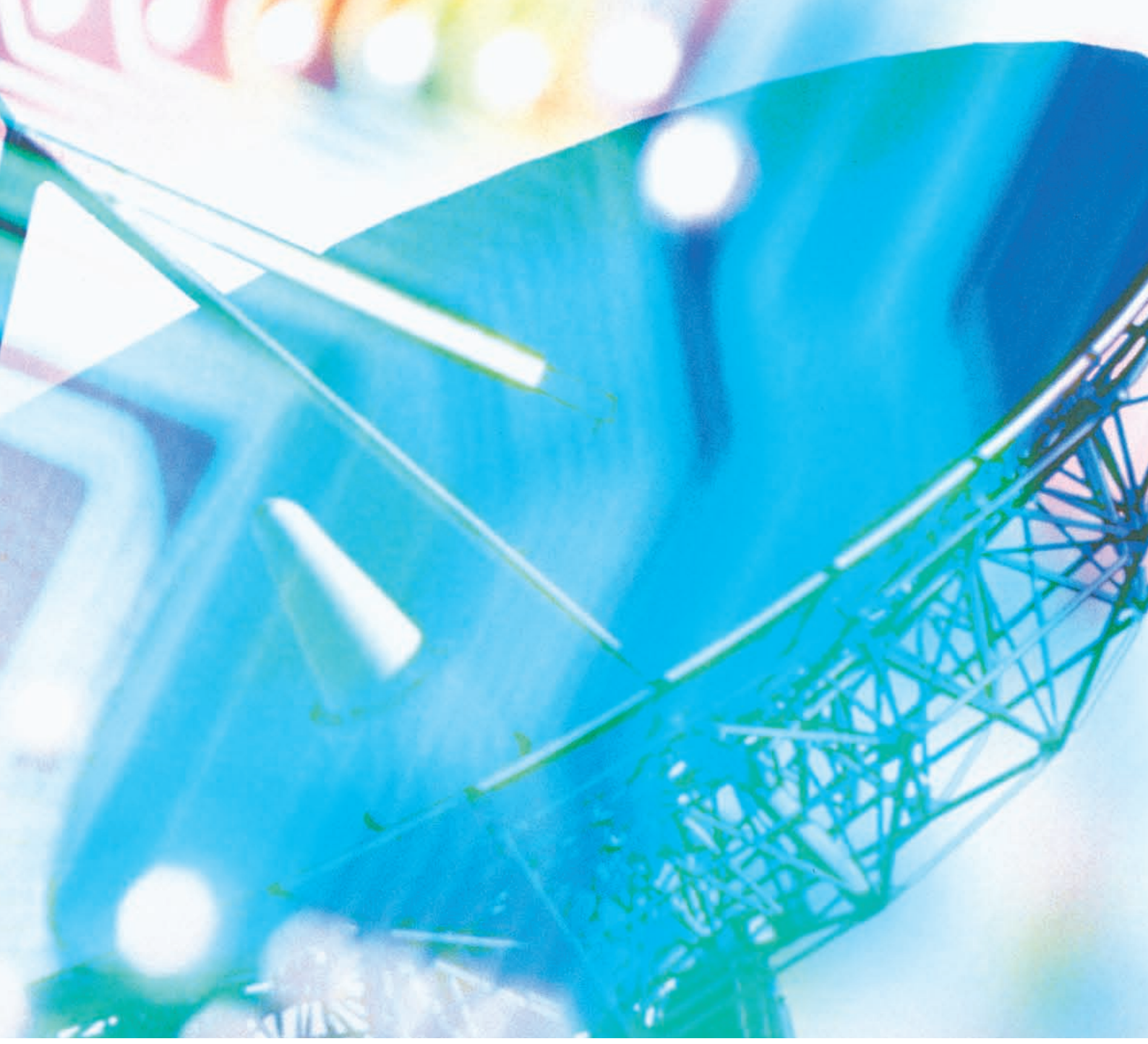


Features

Compact and Lightweight (15 kg in standard configuration)

- Easy portability for installation and maintenance work

High C/N and Superior Distortion Characteristics

- High-stability crystal oscillator as standard

Simple Operation

- Built-in Measure functions (frequency counter, C/N, channel power, adjacent channel power, occupied frequency bandwidth, burst average power and template pass/fail function) for evaluating radio equipment
- User-defined functions
- Zone marker/zone sweep
- Two-screen display
- FM demodulation waveform display
- Memory card slots (for saving/recalling trace data and parameters, and for saving screens in bitmap format)

Millimeter-wave Applications

- External mixer input/output as standard
- Up to 110 GHz with external mixer

Versatile Options for Wide Applications

- Narrow resolution bandwidth (10 Hz to 300 Hz)
- High-speed time domain sweep
- Trigger/gate circuit
- AM/FM Demodulator (sound monitor)
- Centronics interface (not installed simultaneously with GPIB)

Easy-to-set Automatic Measurements

- Built-in PTA controller function

Compact and Powerful

Synthesized Local Oscillator

The synthesized local oscillator design permits stable measurements without disturbance due to analyzer frequency drift. The level stabilizes within 30 minutes after power-on, making this unit especially suitable for on-site maintenance and adjustment where work must be completed quickly.

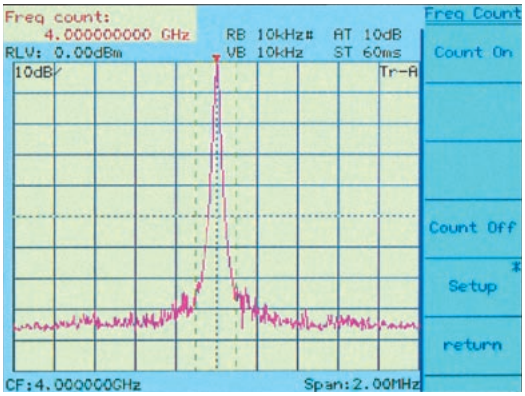
Excellent Cost Performance and Superior Average Noise Level

The superior basic performance, including noise sidebands, average noise level, and spurious response, offers excellent cost performance. Option 03 provides a 10 Hz RBW.

Average noise level (RBW: 1 kHz)	≤–115 dBm (1 MHz to 1 GHz) ≤–115 dBm +1.5f [GHz] dB (1 GHz to 3.1 GHz) ≤–114 dBm (3.1 GHz to 8.1 GHz) ≤–113 dBm (8 GHz to 14.3 GHz) ≤–105 dBm (14.1 GHz to 26.5 GHz) ≤–101 dBm (26.2 GHz to 40 GHz)
Noise sidebands	≤–95 +20 log (n) dBc/Hz ∗: 1 MHz to 40 GHz, 10 kHz offset, n: local harmonic order
Spurious response	Second harmonic distortion: ≤–60 dBc (10 MHz to 200 MHz, mixer input: –30 dBm) ≤–70 dBc (200 MHz to 1.55 GHz, mixer input: –30 dBm) ≤–90 dBc or noise level (1.55 GHz to 20 GHz, mixer input: –10 dBm) Two-signal Third-order intermodulation distortion: ≤–70 dBc (10 MHz to 100 MHz) ≤–80 dBc (100 MHz to 8.1 GHz) ≤–75 dBc or noise level (8.1 GHz to 26.5 GHz) ≤–75 dBc or noise level (typical, 26.5 GHz to 40 GHz) ∗: Frequency difference of two signals: ≥50 kHz, mixer input: –30 dBm

Counter with 1 Hz Resolution

The MS2668C has a full complement of frequency counter functions. The resolution is ±1 Hz max. even at full span, supporting high-speed frequency measurement. The high sensitivity compared to ordinary counters makes it easy to select one signal from many and determine its frequency.



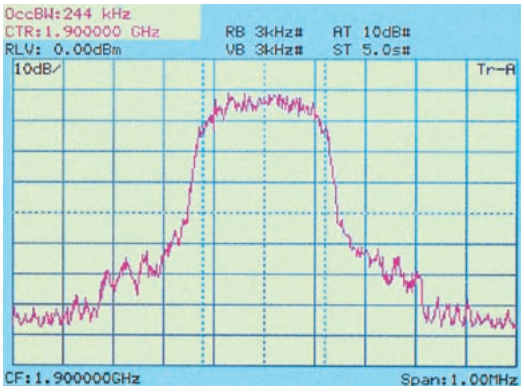
Frequency Measurement (1 Hz Resolution)

100 dB Display Dynamic Range

The MS2668C can display nearly 90 dB on a single screen for measurements requiring a wide dynamic range, such as adjacent channel power.

High-accuracy Measurement

Automatic calibration ensures a high level accuracy. A span accuracy of 5% and 501 sampling points ensure accurate occupied frequency bandwidth and adjacent channel power measurements.



Occupied Frequency Bandwidth Measurement

Convenient, Easy-to-Use Functions

Simple Operation

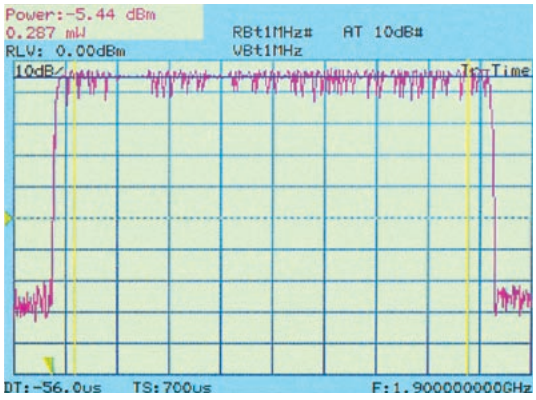
Users require ease of operation in a wide variety of contexts. The simple front-panel layout and soft-key menus offer easy operability. The new Page Learning and User-defined functions minimize the steps required for a procedure.

Bright Color Screen

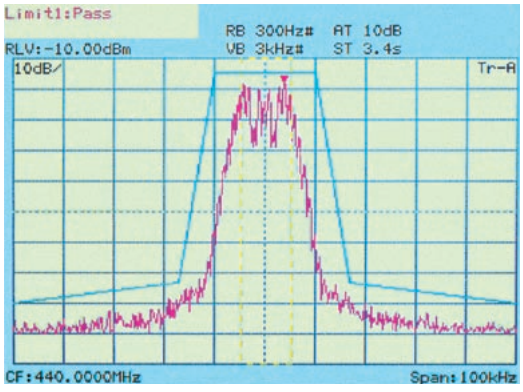
The 5.5-inch bright color TFT LCD displays easy-to-read scales, measured waveforms, settings and parameters.
Each color can be changed independently and when the soft-key display is turned off, the screen area enlarges to 80 (H) × 180 (W) mm, which is comparable to an 8-inch CRT.

Radio Evaluation (Measure Functions)

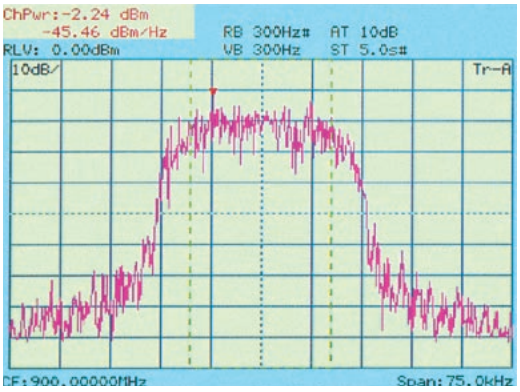
The full range of functions including measurement of power levels, frequencies, adjacent channel power, and mask and time template measurements support easy evaluation of radio performance. Key operation is simple and high-speed calculations make measurement fast and efficient.



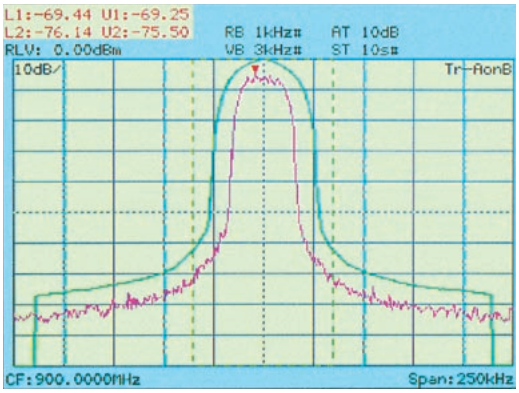
Burst Average Power Measurement



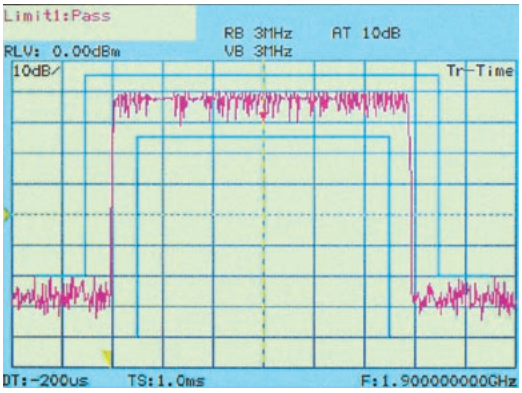
Mask Measurement



Channel Power Measurement



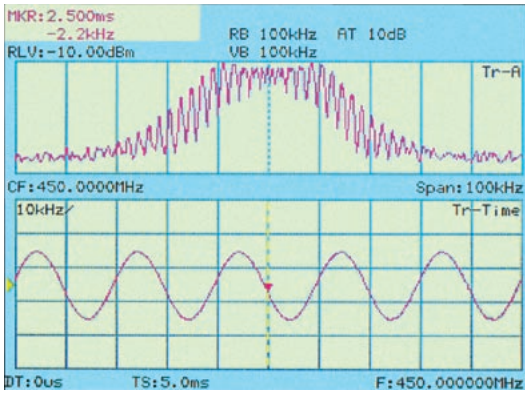
Adjacent Channel Power Measurement



Time Template Measurement

FM Demodulated Waveform Display

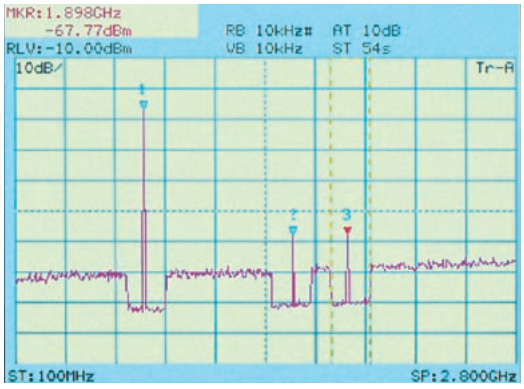
This function displays FM-demodulated waveforms with an accuracy of 5% over the range ±10 kHz to ±1 MHz. When used with the High-speed Time Domain Sweep (Option 04) and Trigger/ Gate Circuit (Option 06), the frequency deviation of modulated signals, and frequency switching times of radio equipment and VCOs can be measured.



Spectrum and FM-demodulation Waveform

Zone and Multi-zone Sweep

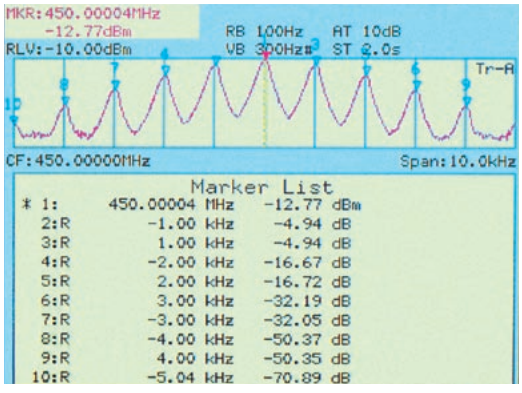
Sweeps can be limited to zones defined by zone markers, resulting in shorter sweep times. This zone-sweep function can be combined with Measure functions such as Noise Measure to directly read the total noise power in the zone, greatly reducing measurement times. The multizone sweep function can sweep a maximum of 10 zones.



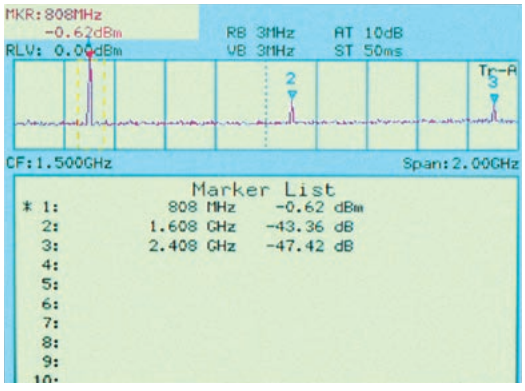
Multi-zone Sweep

Zone Markers and Multimarkers

Measurement is quick because zone markers are set automatically at the peak signal in a given marker range. Using the Multimarker function, automatic measurements can be performed for up to 10 markers with the results displayed in a table. The Multimarker function also supports measurement of 10 carrier harmonics and the 10 highest spurious levels in the frequency span. A maximum of 10 markers can be set manually for automatic frequency and amplitude measurements.



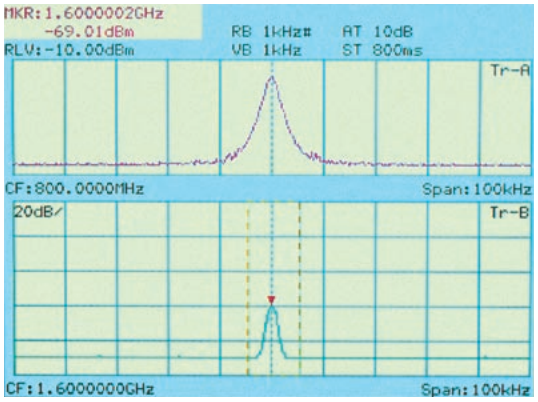
Multi-marker (Highest 10 points)



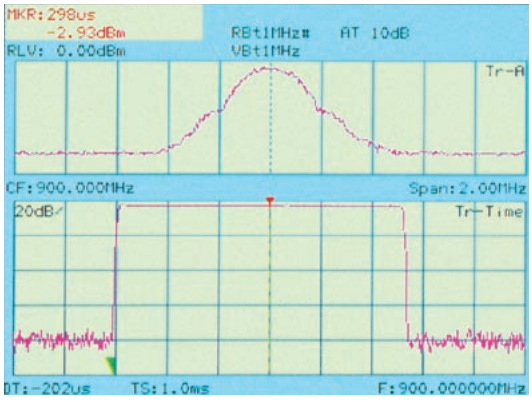
Multi-marker (Harmonics Measurement)

Split-screen Display

Using the split screen, Trace-A and Trace-B waveforms are displayed simultaneously on the same screen for easy comparison. Moreover, the same signal can be displayed in the frequency and time domains. The split-screen display also permits efficient adjustment of signal levels and measurement of harmonic distortion too. Besides displaying amplitude in the time domain the FM demodulation waveform can be displayed as well.



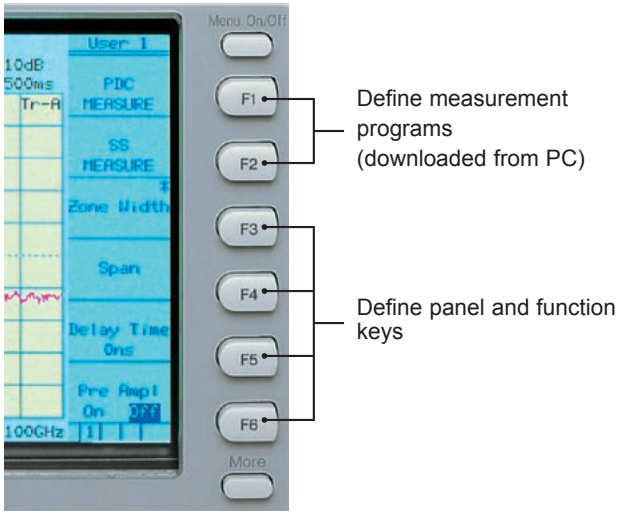
Two Traces with Different Frequencies



Spectrum and Time Domain Measurement

User-defined Functions

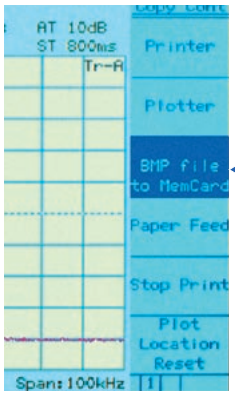
Execution of measurement programs downloaded from a PC or memory card is made easy by user-defined menu keys.
The measurement program is executed simply by pressing the defined key. Other panel and function keys can also be predefined in the same way.



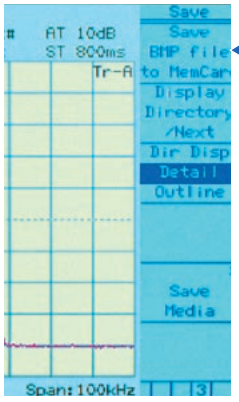
User-defined Menu

Screen Bitmap Saved to Memory Card

Instead of printing a screen hard copy, the screen can be saved as a bitmap to a memory card.
Report editing is made easy by editing the saved bitmap using a PC.



Press this key to save the screen in bitmap format to a memory card. The file number of each saved is incremented automatically.



The screen can also be saved to a memory card using this key but the file number must be specified manually.

Versatile Options

The enhanced performance and digital functions of the latest radio equipment requires measuring instruments with even more sophisticated functions and performance. A full line of versatile options meets this need.

Better Basic Performance

Narrow Resolution Bandwidth (Option 02/03)

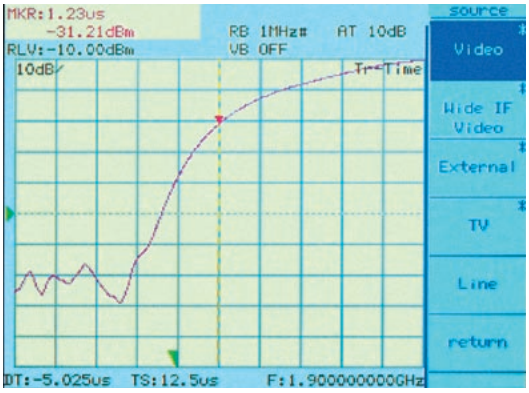
The frequency resolution is improved by adding an optional narrow resolution bandwidth filter. (Option 02 for 30, 100, and 300 Hz, and Option 03 for 10, 30, 100, 300 Hz) The average noise level at a RBW of 10 Hz is specified for Option 03.

Testing Digital Mobile Communication Equipment

High-speed Time Domain Sweep (Option 04)

Testing of TDM radio equipment requires time domain (zero-span) measurements of antenna power, transient response characteristics of burst transmissions, transmission timing, and other characteristics. The high-speed time domain sweep option boasts sweep times of 12.5 µs max. and a resolution of 0.025 µs max. to support these measurements.

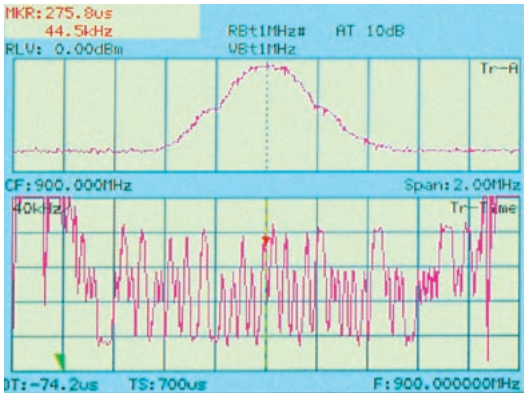
∗: This option must be used with the Trigger/Gate Circuit (Option 06).



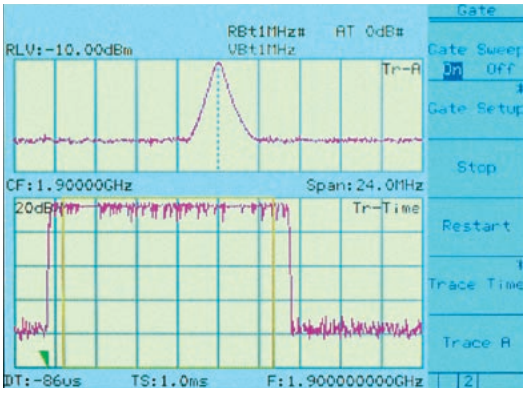
High-speed Time Domain Measurement (TS = 12.5 µs)

Trigger/Gate Circuit (Option 06)

The trigger function offers stable measurements of burst signals in the time domain. External, video, wide IF video, or line trigger can be selected.
PASS/FAIL measurements are easily made on TDMA radio burst signals using limit lines created with the Template function.
Pre- and post-trigger delays can be used.
Burst signals can also be measured in the frequency domain using the Gate Sweep function. Using the Wide IF Video Trigger function eliminates the need for the previously required external trigger source.



Wide IF Video Trigger Function



Wide IF Video Trigger and Gate Functions

Configuring Automated Measurement System

RS-232C Interface (Standard)

The RS-232C interface can be used to output a hard copy to a printer or plotter or for remote control of the analyzer from a connected PC.
A modem can be used for easy remote operation.

Centronics Interface (Option 10)

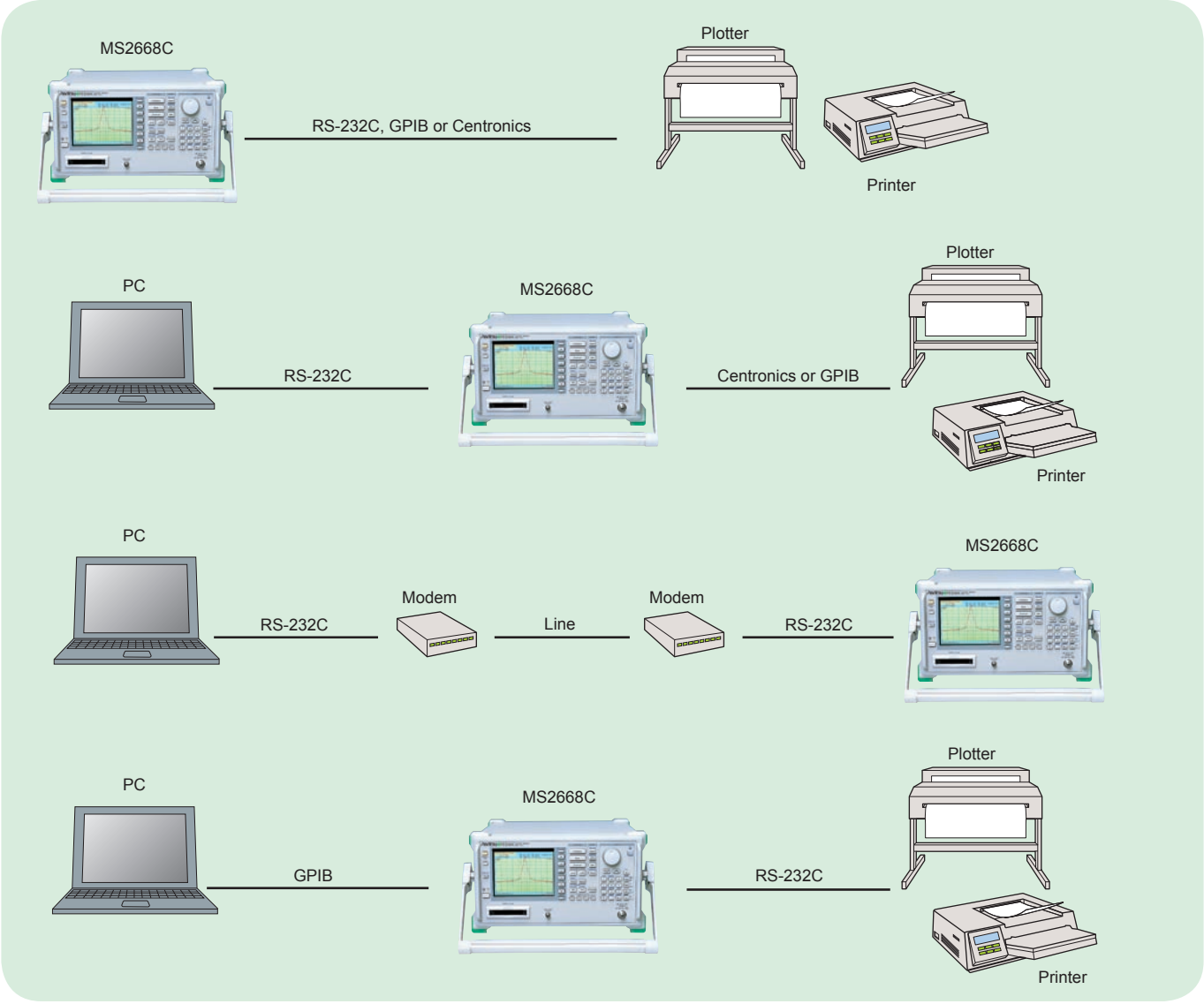
The Centronics interface can output data to a printer.
(This option cannot be installed simultaneously with the GPIB interface.)

GPIB Interface (Standard)

In addition to remote control, the GPIB interface can also be used to output data to a printer/plotter. (Option 10 can not be installed simultaneously with this option.)

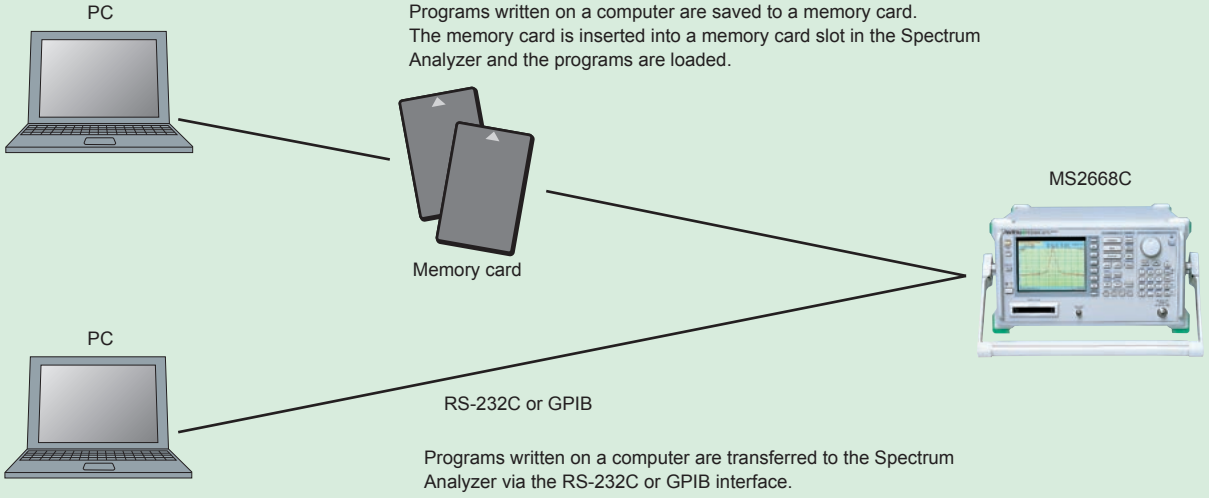
Two Memory Card Slots (Standard)

Memory cards are used to save and recall measurement settings and waveform data, as well as to upload and download PTA programs. Two cards up to 2 Mbytes are supported (PCMCIA ver. 2.0, type-I)

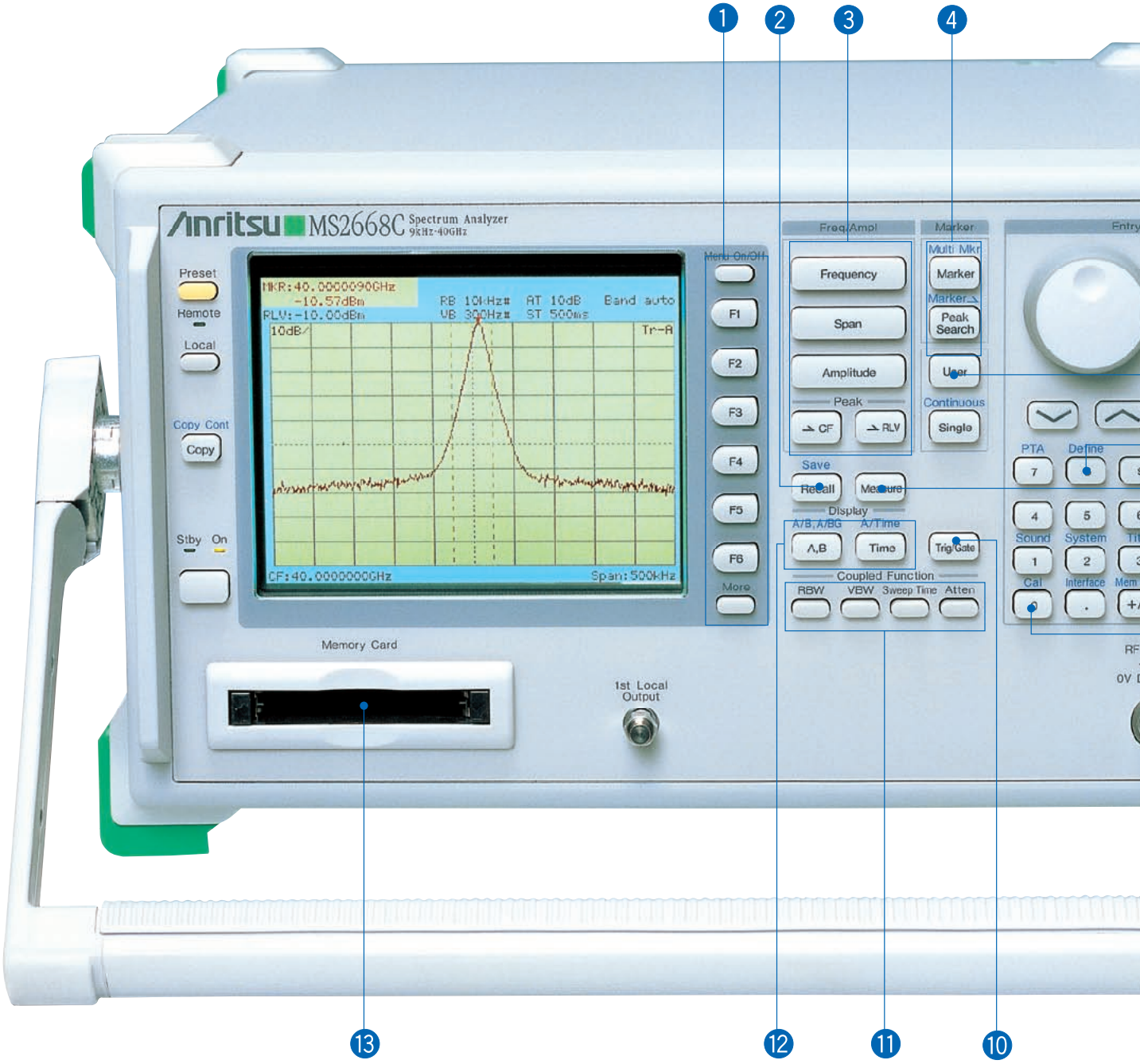


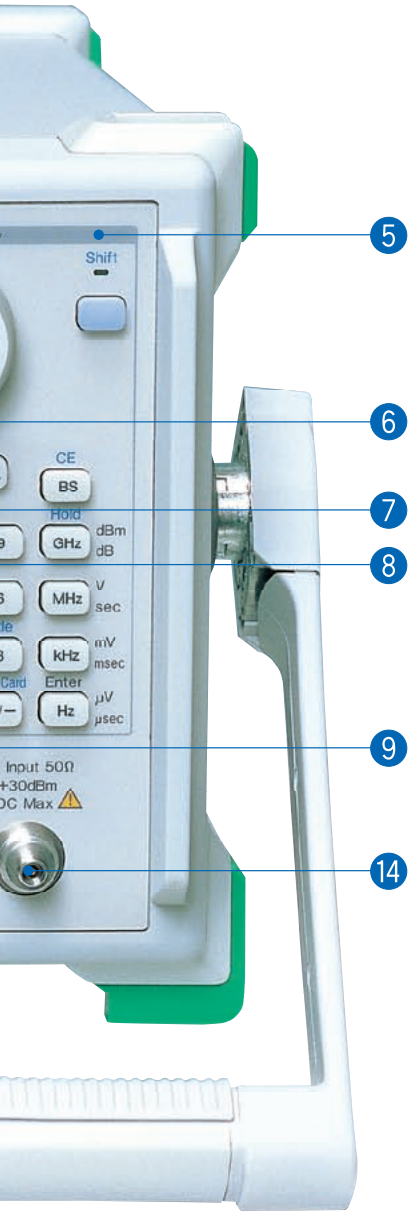
Automated Measurement without External Controller

The built-in microcomputer (PTA) functions use the analyzer as a controller, eliminating the need for an external controller and making configuration of an automated measurement system easy. The two methods for loading programs are shown below.



Easy-to-Use Key Layout





❶ **Function keys F1 to F6**
Select on-screen menu items
Menu on/off keys turn menus on and off, and [more] key turns menu pages.

❷ **Save/recall**
Saves and recalls measurement settings and measured waveforms
Data can be saved either to internal memory or to a memory card. (In internal memory, up to 12 data sets can be saved.)

❸ **Main functions**
Set frequency, span, amplitude and other parameters

❹ **Markers**
Normal markers, multimarkers (maximum 10 numbers), zone markers and zone sweeping are provided.

❺ **Entry keys**
Input numeric values, units, and alphabetic characters

❻ **User keys**
Register any panel and menu key functions, as well as application software functions to user keys.

❼ **User define key**
Define's functions of user-defined keys
Up to 3-pages can be predefined.

❽ **Measure key**
Executes various operations based on waveform data
High-speed measurements and computations are performed without the need for an external personal computer.

❾ **Calibration**
The built-in high-precision calibration signal source provides accurate measurements.

❿ **Trigger/gate**
The trigger can be set in the time domain mode.

⓫ **Coupled-function keys**
Set parameters other than those set using main function keys
Normally set "Auto" for optimum values.

⓬ **Display**
Can be switched between frequency and time domains, and has two-screen display modes.

⓭ **Memory card slots**
Support memory cards up to 2 MB
Two type-1 memory cards conforming to PCMCIA ver. 2.0 standards can be used simultaneously.

⓮ **RF connector**
For input of signals at levels up to +30 dBm (maximum DC input: ±0 V)

Specifications

Except where noted otherwise, specified values are obtained after warming-up equipment for 30 minutes at a constant ambient temperature and then performing calibration. The typical values are given for reference, and are not guaranteed.

Frequency	Frequency range	9 kHz to 40 GHz
	Frequency band	Band 0: 0 to 3.2 GHz (n = 1), Band 1–: 3.1 GHz to 5.6 GHz (n = 1), Band 1+: 5.4 GHz to 8.1 GHz (n = 1), Band 1+: 8.0 GHz to 14.3 GHz (n = 2), Band 2–: 14.1 GHz to 26.5 GHz (n = 4), Band 3–: 26.2 GHz to 40 GHz (n = 6) ∗n: local harmonic order
	Pre-selector range	3.1 GHz to 40 GHz
	Frequency setting resolution	(1 × n) Hz ∗n: local harmonic order
	Frequency display accuracy	± (display frequency × reference frequency accuracy + span × span accuracy) ∗Span: ≥ (10 × n) kHz, n: local harmonic order
	Marker frequency display accuracy	Normal marker: Same as display frequency accuracy Delta marker: Same as frequency span accuracy
	Frequency counter	Resolution: 1, 10, 100 Hz, 1 kHz Accuracy: Display frequency x reference frequency accuracy ±1 LSD (at S/N: ≥20 dB)
	Frequency span	Setting range: 0 Hz, (100 × n) Hz to 40 GHz ∗n: local harmonic order Accuracy: ±5%
	Resolution bandwidth (RBW) (3 dB bandwidth)	Setting range: 1, 3, 10, 30, 100, 300 kHz, 1, 3 MHz (manually settable, or automatically settable according to frequency span) ∗Option 02 (30, 100, 300 Hz), Option 03 (10, 30, 100, 300 Hz) added Measurements of noise, C/N, adjacent channel power and channel power using Measure function are executed with the calculated equivalent noise bandwidth of the RBW. Bandwidth accuracy: ±20% (1 kHz to 1 MHz), ±30% (3 MHz) Selectivity (60 dB : 3 dB): ≤15:1
	Video bandwidth (VBW)	1 Hz to 3 MHz (1-3 sequence), OFF ∗Manually settable, or automatically settable according to RBW
	Signal purity and stability	Sideband noise: ≤–95 + 20 log n dBc/Hz (1 MHz to 40 GHz, 10 kHz offset) ∗n: local harmonic order Residual FM: ≤20 Hz p-p/0.1 s (1 GHz, span: 0 Hz) Frequency drift: ≤200 × n Hz/min (span: ≤10 kHz, sweep time: ≤100 s) ∗After 1 hour warm-up at constant ambient temperature; n: local harmonic order
	Reference oscillator	Frequency: 10 MHz Start-up characteristics: ≤5 × 10^{-8} /year (after 10 minutes warm-up, referenced to frequency after 24 hours warm-up) Aging rate: ≤1 × 10^{-7} /year, ≤2 × 10^{-8} /day Temperature characteristics: ±5 × 10^{-8} (0˚ to 50˚C, referenced to frequency at 25˚C)
Amplitude	Level measurement	Measurement range: Average noise level to +30 dBm Maximum input level: +30 dBm (CW average power, RF ATT: ≥10 dB), 0 V Average noise level: ≤–115 dBm (1 MHz to 1 GHz), ≤–115 dBm + 1.5f [GHz] dB (1 GHz to 3.1 GHz), ≤–114 dBm (3.1 GHz to 8.1 GHz), ≤–113 dBm (8.0 GHz to 14.3 GHz), ≤–105 dBm (14.1 GHz to 26.5 GHz), ≤–101 dBm (26.2 GHz to 40 GHz) ∗RBW: 1 kHz, VBW: 1 Hz, RF ATT: 0 dB Residual response: ≤–90 dBm (RF ATT: 0 dB, input: 50 Ω terminated, 1 MHz to 8.1 GHz)
	Reference level	Setting range Log scale: –100 to +30 dBm, Linear scale: 224 µV to 7.07 V Unit Log scale: dBm, dBµV, dBmV, V, dBµV (emf), W Linear scale: V Reference level accuracy: ±0.4 dB (–49.9 to 0 dBm), ±0.75 dB (–69.9 to –50 dBm, +0.1 to +30 dBm), ±1.5 dB (–80 to –70 dBm) ∗After calibration, at 100 MHz, span: 1 MHz (when RF ATT, RBW, VBW, and sweep time set to AUTO) RBW switching uncertainty: ±0.3 dB (1 kHz to 1 MHz), ±0.4 dB (3 MHz) ∗After calibration, referenced to RBW: 3 kHz Input attenuator (RF ATT) Setting range: 0 to 70 dB (10 dB steps) ∗Manual settable, or automatically settable according to reference level Switching uncertainty: ±0.3 dB (0 to 50 dB), ±1.0 dB (0 to 70 dB) ∗After calibration, frequency: 100 MHz, referenced to RF ATT: 10 dB
	Frequency response	Relative: ±1.5 dB (9 kHz to 3.2 GHz), ±1.0 dB (100 kHz to 3.2 GHz), ±1.5 dB (3.1 GHz to 8.1 GHz), ±3.0 dB (8 GHz to 14.3 GHz), ±4.0 dB (14.1 GHz to 26.5 GHz), ±4.0 dB (26.2 GHz to 40 GHz) ∗After pre-selector tuning at microwave band, referenced to midpoint between highest and lowest frequency deviation in each band. Absolute: ±5.0 dB (9 kHz to 40 GHz, RF ATT: 10 dB, referenced to 100 MHz) ∗After pre-selector tuning at microwave band
	Waveform display	Scale (10 div.) Log scale: 10, 5, 2, 1 dB/div Linear scale: 10, 5, 2, 1%/div Linearity (after calibration) Log scale: ±0.4 dB (–20 to 0 dB, RBW: ≤1 MHz), ±1.0 dB (–70 to 0 dB, RBW: ≤100 kHz), ±1.5 dB (–85 to 0 dB, RBW: ≤3 kHz), ±2.5 dB (–90 to 0 dB, RBW: ≤3 kHz) Linear scale: ±4% (compared to reference level) Marker level resolution Log scale: 0.01 dB, Linear scale: 0.02% of reference level

Amplitude	Spurious response	2nd harmonic distortion: ≤–60 dBc (10 MHz to 200 MHz, mixer input: –30 dBm), ≤–70 dBc (200 MHz to 1.55 GHz, mixer input: –30 dBm), ≤–90 dBc or noise level (1.55 GHz to 20 GHz, mixer input: –10 dBm) Two signal 3rd order intermodulation distortion: ≤–70 dBc (10 MHz to 100 MHz), ≤–80 dBc (100 MHz to 8.1 GHz), ≤–75 dBc or average noise level (8.1 GHz to 26.5 GHz), ≤–75 dBc or average noise level (typ., 26.5 GHz to 40 GHz) ∗Frequency difference of two signals: ≥50 kHz, mixer input: –30 dBm Image response: ≤–65 dBc (≤18 GHz), ≤–60 dBc (≤22 GHz), ≤–55 dBc (≤40 GHz) Multiple/out of band response: ≤–70 dBc (≤14 GHz), ≤–60 dBc (≤26 GHz), ≤–55 dBc (≤40 GHz)
	1 dB gain compression	≥–5 dBm (≥100 MHz, at mixer input)
Sweep	Sweep time	Setting range: 20 ms to 1000 s (manually settable, or automatically settable according to span, RBW, and VBW) Accuracy: ±15% (20 ms to 100 s), ±25% (110 s to 1000 s), ±1% (time domain sweep: digital zero span mode)
	Sweep mode	Continuous, Single
	Time domain sweep mode	Analog zero span, Digital zero span
	Zero sweep	Sweeps only in frequency range indicated by zone marker.
	Tracking sweep	Sweeps while tracing peak points within zone marker (zone sweep also possible).
Functions	Number of data points	501
	Detection mode	NORMAL: Simultaneously displays max. and min. points between sample points. POS PEAK: Displays max. point between sample points. NEG PEAK: Displays min. point between sample points. SAMPLE: Displays momentary value at sample points. Detection mode switching uncertainty: ±0.5 dB (at reference level)
	Display	Color TFT-LCD, Size: 5.5-inch, Number of colors: 17 (RGB, each 64-scale settable), Intensity adjustment: 5 steps settable
	Display functions	Trace A: Displays frequency spectrum. Trace B: Displays frequency spectrum. Trace Time: Displays time domain waveform at center frequency. Trace A/B: Displays Trace A and Trace B simultaneously. Simultaneous sweep of same frequency, alternate sweep of independent frequencies. Trace A/BG: Displays frequency region to be observed (background) and object band (foreground) selected from background with zone marker simultaneously. Trace A/Time: Displays frequency spectrum, and time domain waveform at center frequency simultaneously. Trace move/calculation: A → B, B → A, A ↔ B, A + B → A, A – B → A, A – B + DL → A
	Storage functions	NORMAL, VIEW, MAX HOLD, MIN HOLD, AVERAGE, CUMULATIVE, OVER WRITE
	FM demodulation waveform display function	Demodulation range: 2, 5, 10, 20, 50, 100, 200 kHz/div Marker display Accuracy: ±5% of full scale (referenced to center frequency, DC-coupled, RBW: 3 MHz, VBW: 1 Hz, CW) Demodulation frequency response: DC (50 Hz at AC-coupled) to 100 kHz (range: ≤20 kHz/div, VBW: Off, at 3 dB bandwidth) DC (50 Hz at AC-coupled) to 500 kHz (range: ≤50 kHz/div, VBW: Off, at 3 dB bandwidth) ∗RBW: ≥1 kHz to 3 MHz usable
	Input connector	K-J, 50 Ω
	Auxiliary signal input and output	IF OUTPUT: –10 dBm (typ., 100 MHz, upper edge of scale, 50 Ω terminated), 10.69 MHz, BNC connector VIDEO OUTPUT (Y): 0 to 0.5 V ± 0.1 V (typ., from lower edge to upper edge at 10 dB/div) 0 to 0.4 V ± 0.1 V (typ., from lower edge to upper edge at 10%/div) BNC connector ∗75 Ω terminated at 100 MHz input COMPOSITE OUTPUT: For NTSC, 1 Vp-p (75 Ω terminated), BNC connector EXT REF INPUT: 10 MHz ± 10 Hz, –10 to +2 dBm (50 Ω terminated), BNC connector REF BUFFERED OUTPUT: ≥0 dBm (50 Ω terminated), BNC connector 1ST LOCAL OUTPUT: 4 GHz to 7 GHz, ≥+8 dBm, 50 Ω, SMA-J connector
	Signal search	AUTO TUNE, PEAK → CF, PEAK → REF, SCROLL
	Zone marker	NORMAL, DELTA
	Marker	MARKER → CF, MARKER → REF, MARKER → CF STEP SIZE, Δ MARKER → SPAN, ZONE → SPAN
	Peak search	PEAK, NEXT PEAK, NEXT RIGHT PEAK, NEXT LEFT PEAK, MIN DIP, NEXT DIP
	Multi-marker	Number of markers: 10 max. (HIGHEST 10, HARMONICS, MANUAL SET)
	Measure	Noise power (dBm/Hz, dBm/ch), C/N (dBc/Hz, dBc/ch), Occupied bandwidth (power N% method, X-dB down method), Adjacent channel power (REF: total power/reference level/in-band level method, channel designate display: 2 channels × 2 graphic display), Average power of burst signal (average power in designated time range of time domain waveform), Channel power (dBm, dBm/Hz), Template comparison (upper/lower limits × each 2, time domain), MASK (upper/lower × each 2, frequency domain)
	Save/Recall	Saves setting conditions and waveform data to internal memory (max. 12) or memory card.
	Hard copy	Printer (HP dot matrix, EPSON dot matrix or compatible models): Display data hard-copied via RS-232C, GPIB and Centronics (Option 10) interfaces ∗HP dot image (control code: PCL3), EPSON dot image (control code: ESC/P-J84) There are restrictions on compatible types. Plotter (HP-GL, GP-GL compatible models): Screen output via RS-232C and GPIB interface
	PTA	Language: PTL (BASIC interpreter) Programming: Using external computer. Program memory: Memory card, upload/download to/from external computer Programming capacity: 192 KB Data processing: Directly accesses measurement data according to system variables, system subroutines, and system functions

Functions	RS-232C	Outputs data to printer and plotter. Control from external computer (excluding power switch).
	GPIB	Meets IEEE488.2. Controlled by external computer (excluding power switch). Or controls external equipment with PTA. Interface function: SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT1, C1, C2, C3, C4, C28
	Correction	Automatic correction of insertion loss of MA1621A Impedance Transformer Correction accuracy (RF ATT: ≥10 dB): ±2.5 dB (9 kHz to 100 kHz), ±1.5 dB (100 kHz to 2 GHz), ±2.0 dB (2 GHz to 3 GHz) ∗Typical value
	Memory card interface	Functions: Saving/Recalling measurement parameters/Waveform data, Uploading/Downloading PTA programs; Supported cards: SRAM, EPROM, Flash EEROM Connector: PCMCIA Rel. 2.0, 2 slots ∗ SRAM Memory cards: Read and write (Card size:2 MB max.) EPROM and EEROM Memory cards: Read (Card size: 2 MB max.) The supported operating systems are Windows 95, 98, and XP.
External mixer	Frequency	Frequency range: 18 GHz to 110 GHz Frequency band configuration Band K: 18 GHz to 26.5 GHz (n = 4), Band A: 26.5 GHz to 40 GHz (n = 6), Band Q: 33 GHz to 50 GHz (n = 8), Band U: 40 GHz to 60 GHz (n = 9), Band V: 50 GHz to 75 GHz (n = 11), Band E: 50 GHz to 90 GHz (n = 13), Band W: 75 GHz to 110 GHz (n = 16) Span setting range: 0 Hz, (100 × n) Hz to each bandwidth ∗n: local harmonic order
	Amplitude	Level measurement Mixer conversion loss setting range: 15 to 85 dB Maximum input level: Depends on external mixer Average noise level: Depends on external mixer Reference level setting range: –100 to (–25 + M) dBm ∗Log scale, M: Mixer conversion loss Frequency response: Depends on the external mixer used
	Input/output	Suitable mixer: 2-port mixer only (local frequency: 4 GHz to 7 GHz, IF frequency: 689.31 MHz) Display gain: 0 ± 2 dB (external mixer input: –10 dBm, at mixer conversion loss of 15 dB)
Others	EMC	EN61326-1, EN61000-3-2
	LVD	EN61010-1
	Vibration	MIL-STD-810D
	Power supply (operating range)	85 to 132 VAC/170 to 250 VAC (automatic voltage switching), 47.5 Hz to 63 Hz, ≤400 VA
	Dimensions and mass	320 (W) × 177 (H) × 381 (D) mm, ≤15 kg (without options)
	Ambient temperature	0˚ to +50˚C (operation), –40˚ to +75˚C (storage)

• Option 02: Narrow Resolution Bandwidth

Resolution bandwidth (3 dB)	30, 100, 300 Hz
Resolution bandwidth switching uncertainty	±0.4 dB (RBW: 3 kHz reference)
Resolution bandwidth accuracy	±20%
Selectivity (60 dB : 3 dB)	≤15:1

• Option 03: Narrow Resolution Bandwidth

Resolution bandwidth (3 dB)	10, 30, 100, 300 Hz
Resolution bandwidth switching uncertainty	±0.4 dB (RBW: 3 kHz reference)
Resolution bandwidth accuracy	±20%
Selectivity (60 dB : 3 dB)	≤15:1
Average noise level	≤–135 dBm (1 MHz to 1 GHz) ≤–135 dBm + 1.5f [GHz] dB (1 GHz to 3.1 GHz) ≤–132 dBm (3.1 GHz to 8.1 GHz) ≤–131 dBm (8 GHz to 14.3 GHz) ≤–123 dBm (14.1 GHz to 26.5 GHz) ≤–119 dBm (26.2 GHz to 40 GHz) ∗RBW: 10 Hz, VBW: 1 Hz, RF ATT: 0 dB

• Option 04: High-speed Time Domain Sweep*

Sweep time	12.5, 25, 50, 100 µs to 900 µs (one most significant digit settable) 1.0 ms to 19 ms (two upper significant digits settable)
Accuracy	±1%
Marker level resolution	Log scale: 0.1 dB Linear scale: 0.2% (relative to reference level)

∗: This option is recommended to be mounted together with option 06.

• Option 06: Trigger/Gate Circuit

Trigger switch	FREERUN, TRIGGERED
Trigger source	EXT Trigger level: ±10 V (resolution: 0.1 V), TTL level Trigger slope: Rise/Fall Connector: BNC VIDEO Log scale: –100 to 0 dB (resolution: 1 dB) Trigger slope: Rise/Fall WIDE IF VIDEO Trigger level: High, middle, or low selectable Bandwidth: ≥20 MHz Trigger slope: Rise/Fall LINE Frequency: 47.5 Hz to 63 Hz (line lock)
Trigger delay	Pre-trigger (displays waveform from previous max. 1 screen at trigger point) Range: –time span to 0 s, Resolution: time span/500 Post-trigger (displays waveform from after max. 65.5 ms at trigger point) Range: 0 to 65.5 ms, Resolution: 1 µs
Gate sweep	In frequency domain, displays spectrum of input signal in specified gate interval. Gate delay: 0 to 65.5 ms (from trigger point, resolution: 1 µs) Gate width: 2 µs to 65.5 ms (from gate delay, resolution: 1 µs)

• Option 07: AM/FM Demodulator

Voice output	With internal loudspeaker and earphone connector (ø3.5 jack), adjustable volume

• Option 10: Centronics Interface*

Function	Outputs data to printer (Centronics standard)
Connector	D-Sub 25 pin (jack)

∗: GPIB interface can not be installed simultaneously.

• Option 15: Sweep Signal Output

Sweep output (X)	0 to 10 V ±1 V (≥100 kΩ termination, from left side to right side of display scale), BNC connector
Sweep status output (Z)	TTL level (low level with sweeping), BNC connector

• External Mixer

Models	Frequency range	Flange	Max. input power
MA2740A	18 GHz to 26.5 GHz	MIL-F-3922/68-001KM	100 mW
MA2741A	26.5 GHz to 40 GHz	MIL-F-3922/68-001AM	100 mW
MA2742A	33 GHz to 50 GHz	MIL-F-3922/67B-006	100 mW
MA2743A	40 GHz to 60 GHz	MIL-F-3922/67B-007	100 mW
MA2744A	50 GHz to 75 GHz	MIL-F-3922/67B-008	100 mW
MA2745A	60 GHz to 90 GHz	MIL-F-3922/68B-009	100 mW
MA2746A	75 GHz to 110 GHz	MIL-F-3922/68B-010	100 mW

Ordering Information

Please specify the model/order number, name and quantity when ordering.
The names listed in the chart below are Order Names. The actual name of the item may differ from the Order Name.

Model/Order No.	Name		Remarks
	Main frame		
MS2668C	Spectrum Analyzer		
	Standard accessories		
	Power Cord, 2.6 m:	1 pc	
F0013	Fuse, 5 A:	2 pcs	
W1335AE	MS2668C Operation Manual:	1 copy	
B0329G	Front Cover:	1 pc	3/4MW4U (Build-to order)
	Options		
MS2668C-02	Narrow Resolution Bandwidth		
MS2668C-03	Narrow Resolution Bandwidth		
MS2668C-04	High-speed Time Domain Sweep		
MS2668C-06	Trigger/Gate Circuit		
MS2668C-07	AM/FM Demodulator		Outputs to loudspeaker or earphone connector
MS2668C-10	Centronics Interface		GPIB interface can not be used simultaneously
MS2668C-15	Sweep Signal Output		
	Warranty		
MS2668C-90	Extended Three Year Warranty Service		
MS2668C-91	Extended Five Year Warranty Service		
	Application parts		
J0911	Coaxial Cord (K-P · K-P), 1 m		DC to 40 GHz, SUCOFLEX 102A
J0912	Coaxial Cord (K-P · K-P), 0.5 m		DC to 40 GHz, SUCOFLEX 102A
34AKNF50	Coaxial Adaptor		DC to 20 GHz, SWR: 1.5, ruggedized K-P · N-J
J0322B	Coaxial Cord (SMA-P · SMA-P), 1 m		DC to 18 GHz, SUCOFLEX 104
J0561	Coaxial Cord (N-P-5W · 5D-2W · N-P-5W), 1 m		
J0104A	Coaxial Cord (BNC-P · RG-55/U · N-P), 1 m		
CSCJ-256K-SM	256 KB Memory Card		Meets PCMCIA Rel. 2.0
CSCJ-512K-SM	512 KB Memory Card		Meets PCMCIA Rel. 2.0
CSCJ-001M-SM	1024 KB Memory Card		Meets PCMCIA Rel. 2.0
CSCJ-002M-SM	2048 KB Memory Card		Meets PCMCIA Rel. 2.0
B0395A	Rack Mount Kit (IEC)		
B0395B	Rack Mount Kit (JIS)		
MP612A	RF Fuse Holder (without elements)		
MP613A	Fuse Element (5 pcs/set)		
J0805	DC Block (Model 7003)		10 kHz to 18 GHz, ±50 V, N-type, Weinschel product
J0910	DC Block (Model 7006)		10 kHz to 18 GHz, ±50 V, SMA-type, Weinschel product
MA2507A	DC Block Adaptor		50 Ω, 9 kHz to 3 GHz, ±50 V, N-type
MA8601A	DC Block Adaptor		50 Ω, 30 kHz to 2 GHz, ±50 V, N-type
MA8601J	DC Block Adaptor		75 Ω, 10 kHz to 2.2 GHz, ±50 V, N-type
MA1621A	50 Ω → 75 Ω Impedance Transformer		9 kHz to 3 GHz, ±100 V, NC-type
MP614B	50 Ω ↔ 75 Ω Impedance Transformer		50 MHz to 1200 MHz, transformer type, N-P/NC-J, 1 W
J0007	GPIB Cable, 1 m		
J0008	GPIB Cable, 2 m		
J0742A	RS-232C Cable, 1 m		For PC-98 Personal Computer and VP-600, D-Sub 25 pin, straight
J0743A	RS-232C Cable, 1 m		For PC/AT compatible, D-Sub 9 pin, cross
J0064A	7 GHz Band Coaxial/waveguide Adaptor		5.8 GHz to 8.6 GHz, N-J · BRJ-7
J0064C	10 GHz Band Coaxial/waveguide Adaptor		8.2 GHz to 12.4 GHz, N-J · BRJ-10
J0004	Coaxial Adaptor (N-P · SMA-J)		
DGM010-02000EE	Coaxial Cord, 2 m		N-type connector, general use
DGM024-02000EE	Coaxial Cord, 2 m		N-type connector, low-loss type
J0063	Fixed Attenuator for High Power		30 dB, 10 W, DC to 12.4 GHz, N-type
J0395	Fixed Attenuator for High Power		30 dB, 30 W, DC to 9 GHz, N-type
J0078	Fixed Attenuator for High Power		20 dB, 10 W, DC to 18 GHz, N-type
MP526D	High Pass Filter		400 MHz band, N-type
MA1601A	High Pass Filter		800 MHz/900 MHz band, N-type
MA2740A	External Mixer		18 GHz to 26.5 GHz
MA2741A	External Mixer		26.5 GHz to 40 GHz
MA2742A	External Mixer		33 GHz to 50 GHz
MA2743A	External Mixer		40 GHz to 60 GHz
MA2744A	External Mixer		50 GHz to 75 GHz
MA2745A	External Mixer		60 GHz to 90 GHz
MA2746A	External Mixer		75 GHz to 110 GHz
B0421A	Carrying Case (hard type)		With casters
B0421B	Carrying Case (hard type)		Without casters
B0435A	Carrying Case (soft type)		

Note:

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Specifications are subject to change without notice.

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